WHAT IS CLAIMED IS:

1. A refinery and crude oil knowledge management system comprising:

a knowledge base storing a plurality of classes of information related at least to a specific refinery, a collection of equipment for processing crude oils, and a set of operations performed by the collection of equipment to produce crude oil products, each of the plurality of classes of information are associated with or related to each other and organized in a hierarchical system; and

a set of programmable instructions configured for execution by at least one processor for accessing at least one class of the plurality of classes for accessing and disseminating information in response to at least one query, said disseminated information including at least one of crude oil characterizations, experiences of processing crude oils in the refinery, problems encountered during the processing of crude oil in the refinery, and the treatments applied by personnel of the refinery to counteract those problems, said disseminated information facilitating decision-making, risk management of processing crude oils, and the planning and monitoring of chemical treatments applied to the specific refinery's crude oil production processes.

2. The knowledge management system in accordance with Claim 1, wherein the plurality of classes of information comprises:

a customer class containing information relating to an owner of the specific refinery;

a refinery class containing information relating to the specific refinery; and

a crude unit class containing information relating to the collection of equipment for processing crude oil;

a crude tank class containing information relating to the amount of crude oil contained in a feedstock of the specific refinery;

a slop tank class containing information relating to the amount of slop contained in the feedstock;

an equipment configuration class containing information relating to the arrangement of systems, subsystems and components of the collection of equipment; and

an equipment specification class which includes design information relating to the specific refinery.

3. The knowledge management system in accordance with Claim 2, wherein the equipment configuration and equipment specification classes are sub-classes of an equipment class within the hierarchical system, and wherein the crude tank and slop tank classes are sub-classes of the crude unit class within the hierarchical system.

4. The knowledge management system in accordance with Claim 1, wherein the plurality of classes of information comprises:

a product class containing information relating to at least one product produced by the specific refinery;

a product characteristics class containing information relating to the chemical properties of the at least one product produced;

a crude slate class containing information relating to the composition of raw feedstock processed by the specific refinery;

a crude oil characteristics class containing information relating to the chemical properties of one or more crude oils;

a crude oil class containing information relating to a majority of a feedstock processed by a crude unit of the specific refinery;

a production process class containing information relating to a set of operations performed in the crude unit to convert feedstock into products; and

a slop class containing information relating to residual crude oil from previous process runs and/or remaining crude oil from tanks that is mixed with crude oil and processed.

5. The knowledge management system in accordance with Claim 4, wherein the crude oil and slop classes are sub-classes of the crude slate class within the hierarchical system, wherein the crude oil characteristics class is a sub-class of the crude slate class within the hierarchical system, and wherein the product and crude slate classes are a sub-classes of the production process class within the hierarchical system.

6. The knowledge management system in accordance with Claim 1, wherein the plurality of classes of information comprises:

an inspection report class containing information reported by an operator on the condition of refinery equipment;

a maintenance report class containing information reported by maintenance personnel on a service and/or repair performed on refinery equipment;

a service report class containing information selected from the group consisting of crude slate information, production process information, non-destructive testing data, operational data, chemical treatment and problem reports; and

a problem report class containing information relating to at least one identified problem; and

an operational data class containing information relating to equipment performance;

a non-destructive testing class containing information collected from non-destructive testing; and

a chemical treatment class containing information related to one or more chemicals applied to a refinery process.

7. The knowledge management system in accordance with Claim 6, wherein the operation data, inspection, and maintenance classes are sub-classes of an equipment class within the hierarchical system, wherein the non-destructive testing class is a sub-class of a production process class and a crude slate class, and wherein the chemical treatment class is a sub-class of the service report class which in turn is a sub-class of the production process class within the hierarchical system.

8. The knowledge management system in accordance with Claim 1, wherein the plurality of classes of information comprises:

a laboratory analysis class containing results of performed chemical analysis on crude oils, slop, and/or crude oil products;

a laboratory simulation class pertaining to laboratory tests simulating sub-processes of the specific refinery; and

a predictive result class containing information that is generated by predictive analytics and/or a decision support system.

9. A computer readable medium storing a set of instructions configured for execution by at least one processor for performing the steps of:

searching a knowledge base storing a plurality of classes of information related at least to a specific refinery, a collection of equipment for processing crude oils, and a set of operations performed by the collection of equipment to produce crude oil products, each of the plurality of classes of information are associated with or related to each other and organized in a hierarchical system; and

accessing at least one class of the plurality of classes for obtaining and disseminating information in response to at least one query, said disseminated information including at least one of crude oil characterizations, experiences of processing crude oils in the refinery, problems encountered during the processing of crude oil in the refinery, and the treatments applied by personnel of the refinery to counteract those problems, said disseminated information facilitating decision-making, risk management of processing crude oils, and the planning and monitoring of chemical treatments applied to the specific refinery's crude oil production processes.

10. The computer readable medium in accordance with Claim 9, wherein the plurality of classes of information comprises:

a customer class containing information relating to an owner of the specific refinery;

a refinery class containing information relating to the specific refinery; and

a crude unit class containing information relating to the collection of equipment for processing crude oil;

a crude tank class containing information relating to the amount of crude oil contained in a feedstock of the specific refinery;

a slop tank class containing information relating to the amount of slop contained in the feedstock;

an equipment configuration class containing information relating to the arrangement of systems, subsystems and components of the collection of equipment; and

an equipment specification class which includes design information relating to the specific refinery.

11. The computer readable medium in accordance with Claim 10, wherein the equipment configuration and equipment specification classes are sub-classes of an equipment class within the hierarchical system, and wherein the crude tank and slop tank classes are sub-classes of the crude unit class within the hierarchical system.

12. The computer readable medium in accordance with Claim 9, wherein the plurality of classes of information comprises:

a product class containing information relating to at least one product produced by the specific refinery;

a product characteristics class containing information relating to the chemical properties of the at least one product produced;

a crude slate class containing information relating to the composition of raw feedstock processed by the specific refinery;

a crude oil characteristics class containing information relating to the chemical properties of one or more crude oils;

a crude oil class containing information relating to a majority of a feedstock processed by a crude unit of the specific refinery;

a production process class containing information relating to a set of operations performed in the crude unit to convert feedstock into products; and

a slop class containing information relating to residual crude oil from previous process runs and/or remaining crude oil from tanks that is mixed with crude oil and processed.

13. The computer readable medium in accordance with Claim 12, wherein the crude oil and slop classes are sub-classes of the crude slate class within the hierarchical system, wherein the crude oil characteristics class is a sub-class of the crude slate class within the hierarchical system, and wherein the product and crude slate classes are a sub-classes of the production process class within the hierarchical system.

14. The computer readable medium in accordance with Claim 9, wherein the plurality of classes of information comprises:

an inspection report class containing information reported by an operator on the condition of refinery equipment;

a maintenance report class containing information reported by maintenance personnel on a service and/or repair performed on refinery equipment;

a service report class containing information selected from the group consisting of crude slate information, production process information, non-destructive testing data, operational data, chemical treatment and problem reports; and

a problem report class containing information relating to at least one identified problem; and

an operational data class containing information relating to equipment performance;

a non-destructive testing class containing information collected from non-destructive testing; and

a chemical treatment class containing information related to one or more chemicals applied to a refinery process.

15. The computer readable medium in accordance with Claim 14, wherein the operation data, inspection, and maintenance classes are sub-classes of an equipment class within the hierarchical system, wherein the non-destructive testing class is a sub-class of a production process class and a crude slate class, and wherein the chemical treatment class is a sub-class of the service report class which in turn is a sub-class of the production process class within the hierarchical system.

16. The computer readable medium in accordance with Claim 9, wherein the plurality of classes of information comprises:

a laboratory analysis class containing results of performed chemical analysis on crude oils, slop, and/or crude oil products;

a laboratory simulation class pertaining to laboratory tests simulating sub-processes of the specific refinery; and

a predictive result class containing information that is generated by predictive analytics and/or a decision support system.

17. A method for managing information stored within a refinery and crude oil knowledge management system comprising a knowledge base storing a plurality of classes of information related at least to a specific refinery, a collection of equipment for processing crude oils, and a set of operations performed by the

collection of equipment to produce crude oil products, each of the plurality of classes of information are associated with or related to each other and organized in a hierarchical system, and a set of programmable instructions configured for execution by at least one processor for accessing at least one class of the plurality of classes in response to at least one query, said method comprising the steps of:

disseminating information relating to the at least one class accessed in response to the at least one query, and

entering and storing data within at least one class of the plurality of classes, including data related to laboratory analysis and simulations.

18. The method in accordance with Claim 17, wherein said disseminated information including at least one of crude oil characterizations, experiences of processing crude oils in the refinery, problems encountered during the processing of crude oil in the refinery, and the treatments applied by personnel of the refinery to counteract those problems, and wherein said disseminated information facilitating decision-making, risk management of processing crude oils, and the planning and monitoring of chemical treatments applied to the specific refinery's crude oil production processes.

19. The method in accordance with Claim 17, wherein the step of disseminating information includes the steps of creating and editing reports.

20. The method in accordance with Claim 17, wherein the plurality of classes of information comprises:

a customer class containing information relating to an owner of the specific refinery;

a refinery class containing information relating to the specific refinery; and

a crude unit class containing information relating to the collection of equipment for processing crude oil;

a crude tank class containing information relating to the amount of crude oil contained in a feedstock of the specific refinery;

a slop tank class containing information relating to the amount of slop contained in the feedstock;

an equipment configuration class containing information relating to the arrangement of systems, subsystems and components of the collection of equipment; and

an equipment specification class which includes design information relating to the specific refinery.

21. The method in accordance with Claim 20, wherein the equipment configuration and equipment specification classes are sub-classes of an equipment class within the hierarchical system, and wherein the crude tank and slop tank classes are sub-classes of the crude unit class within the hierarchical system.

22. The method in accordance with Claim 17, wherein the plurality of classes of information comprises:

a product class containing information relating to at least one product produced by the specific refinery;

a product characteristics class containing information relating to the chemical properties of the at least one product produced;

a crude slate class containing information relating to the composition of raw feedstock processed by the specific refinery;

a crude oil characteristics class containing information relating to the chemical properties of one or more crude oils;

a crude oil class containing information relating to a majority of a feedstock processed by a crude unit of the specific refinery;

a production process class containing information relating to a set of operations performed in the crude unit to convert feedstock into products; and

a slop class containing information relating to residual crude oil from previous process runs and/or remaining crude oil from tanks that is mixed with crude oil and processed.

23. The method in accordance with Claim 22, wherein the crude oil and slop classes are sub-classes of the crude slate class within the hierarchical system, wherein the crude oil characteristics class is a sub-class of the crude slate class within the hierarchical system, and wherein the product and crude slate classes are a sub-classes of the production process class within the hierarchical system.

24. The method in accordance with Claim 17, wherein the plurality of classes of information comprises:

an inspection report class containing information reported by an operator on the condition of refinery equipment;

a maintenance report class containing information reported by maintenance personnel on a service and/or repair performed on refinery equipment;

a service report class containing information selected from the group consisting of crude slate information, production process information, non-destructive testing data, operational data, chemical treatment and problem reports; and

a problem report class containing information relating to at least one identified problem; and

an operational data class containing information relating to equipment performance;

a non-destructive testing class containing information collected from non-destructive testing; and

a chemical treatment class containing information related to one or more chemicals applied to a refinery process.

25. The method in accordance with Claim 24, wherein the operation data, inspection, and maintenance classes are sub-classes of an equipment class within the hierarchical system, wherein the non-destructive testing class is a sub-class of a production process class and a crude slate class, and wherein the chemical treatment class is a sub-class of the service report class which in turn is a sub-class of the production process class within the hierarchical system.

26. The method in accordance with Claim 17, wherein the plurality of classes of information comprises:

a laboratory analysis class containing results of performed chemical analysis on crude oils, slop, and/or crude oil products;

a laboratory simulation class pertaining to laboratory tests simulating sub-processes of the specific refinery; and

a predictive result class containing information that is generated by predictive analytics and/or a decision support system.

27. A method for searching a refinery and crude oil knowledge management system for obtaining data, said management system comprising a knowledge base storing a plurality of classes of information related at least to a specific refinery, each of the plurality of classes of information are associated with or related to each other and organized in a hierarchical system, and a set of programmable instructions configured for execution by at least one processor for accessing at least one class of the plurality of classes, said method comprising the steps of:

receiving at least one query by said crude oil knowledge management system, said at least one query specifying data for at least one class of the plurality of classes;

accessing the at least one class of the plurality of classes and locating data approximately satisfying the at least one query; and

outputting the located data approximately satisfying the at least one query.

28. A method for validating data received by a refinery and crude oil knowledge management system comprising a knowledge base storing a plurality of classes of information related at least to a specific refinery, each of the plurality of classes of information are associated with or related to each other and organized in a hierarchical system, and a set of programmable instructions configured for execution by at least one processor for validating data associated with at least one class of the plurality of classes, said method comprising the steps of:

comparing the received data with data stored within the refinery and crude oil knowledge management system;

determining if the received data are within at least one predefined range; and

performing at least one action indicating whether the received data are within the at least one predefined range.